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| 22850 7590 08/07/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | | |
| EXAMINER | | | | |
| LUNDGREN, JEFFREY S | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1639 | | | | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/614,516

Applicant(s)

BUREAU ET AL.

Examiner

JEFFREY S. LUNDGREN

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-17, 20-24 and 33-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-17, 20-24, 33 and 34 is/are rejected.
- 7) ☒ Claim(s) 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of the Claims

Claims 1, 2, 4-17, 20-24 and 33-35 are pending in the instant application, and are the subject of the Office Action below.

Claim Rejections - 35 USC § 103 - Modified

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims are 1, 2, 4-17, 20-24 and 34, rejected under 35 U.S.C. § 103(a) as being unpatentable over Yano *et al.*, U.S. Patent No. 4,269,682, issued on May 26, 1981, in view of Boissel *et al.*, U.S. Patent No. 5,350,323, issued on September 27, 1994, and Charlier *et al.*, *Journal of Electroanalytical Chemistry* 465:200-208 (1999), as evidenced by Gregory *et al.*, U.S. Patent No. 5,168,321, issued on December 1, 1992.

Applicants argue that the rejection is improper because none of the references teach the "composite surface". However, for the detailed explanation before, and again reiterated below, the Examiner disagrees (see rejection below).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 is directed to a process for mask-free localized grafting of organic molecules, which are capable of being electrically activated, onto a composite surface comprising

conductive and/or semiconductive portions, by the process comprising placing said organic molecules in contact with said composite surface, in which said grafting is performed and electrochemically in a single step grafting an insulating film of said organic molecules on chosen, defined areas of said conductive and/or semiconductive portions by bringing said areas being brought to a potential higher than or equal to a threshold electrical potential which is determined relative to a reference electrode, a threshold electrical potential being the potential and above which grafting of said organic molecules takes place.

Yano teaches a reference electrode of an insulated gate field effect transistor having the surface of the gate region thereof coated with a hydrophobic organic polymer membrane. Since this reference electrode is much smaller in size than conventional reference electrodes, an integrated measurement system can easily be constructed by using this reference electrode. This measurement system is especially effective for measuring various ions in the living body. Yano teaches the advantages of protected electrodes for these uses:

“In order to improve the chemical resistance and mechanical strength in the resulting membrane, it is preferred that at the step of applying such polysiloxane to the gate surface, a cross-linking agent such as an alkoxy silane, a hydroxysilane, an oxime silane or an acetoxysilane is incorporated into the polysiloxane and the cross-linking treatment is carried out after the coating step.

In addition, monomers capable of forming hydrophobic polymers, such as styrene, divinylbenzene, **acrylonitrile**, acrolein, vinyl acetate, **methyl methacrylate**, butyl acrylate, vinylidene cyanide, chlorostyrene and chloromethylstyrene may be used as the starting compound for formation of a hydrophobic polymeric membrane in this invention.”

Yano, col. 6, lines 6-21. There are a first two electrodes in Yano (20 and 21) that are different than the reference electrode (14) or even the pseudo reference electrode (22), and therefore meets the limitation of a composite surface as defined by the claim. Yano teaches gold/silicon electrodes for the measurement purposes (col. 9, lines 7-68). These multiple electrodes are clearly “materials of different nature” and teaches the formation of the insulating film around the gold reference electrode. Regarding the silver dopant of claim 22, Applicants acknowledge that this is a known practice to those of ordinary skill in the art (see paragraph 0138 – see also Gregory et al., Abstract).

Although Yano teaches certain of the claimed polymer-coated electrodes, Yano does not explicitly suggest that the polymerization be carried out by electrografting.

Charlier teaches a process for: electrografting organic molecules onto a composite surface (i.e., quartz, titanium and platinum; see Experimental on pages 201-202), wherein the organic molecules are insulating, and the electrografting occurs on a defined area (i.e., the electrode), and occurs at the threshold potential. Based on the remarks made in the *Conclusions* of Charlier, it is clear that this process is in fact electrografting, not depositing as Applicants suggest.

The composite materials have a different work function (i.e., see ECQM— see Experimental) as in claim 2; the composite surface comprises silicon (the EQCM), as in claim 5; consists of two different metals (Pt and Ti), as in claims 7 and 8; the thickness of the metals in on the nanoscale, as in claim 9; the organic molecules are electrograftable and electrocleavable (see Figure 2 and description thereof); the electrograftable NVP and MAN meet the limitations of claims 12 and 14-17; the organic molecules meet the limitations of claims 19 and 20, and as in claim 21 by using MAN; and meets the limitations of claim 23 (see Figure 3A and description thereof). Applicants acknowledge that this is a known practice to those of ordinary skill in the art (see paragraph 0138).

Boissel teaches a contact for an electrical connector usable in numerous fields such as data processing, aeronautics, telecommunications and devices implanted in the human body, wherein the contact is formed by electropolymerization (i.e., electrografting) of a monomer such as acrylonitrile, followed by a heat treatment or irradiation to improve its electrical conductivity, so that a contact resistance not exceeding 10 ohms is obtained. The organic polymers which can be used are those which can be transformed into polymers having a cyclic and/or unsaturated structure by a heat treatment or by irradiation.

One of ordinary skill in the art would have had a reasonable expectation of success in arriving at the invention as claimed because each of Yano, Charlier and Boissel are directed to vinyl coated electrodes. One of ordinary skill would have been motivated by the improved chemistries of Charlier and Boissel for forming resistant polymer membranes that protect the metal electrode over the crosslinking approach of Yano, due to the ease in which these polymer

systems can be utilized. Accordingly, the invention as a whole is *prima facie* obvious at the time it was invented.

Claim Objection

Claim 35 is objected for depending from a rejected base claim, but would otherwise be allowable if rewritten into the independent claim 1.

Conclusions

No claim is allowable.

If Applicants should amend the claims, a complete and responsive reply will clearly identify where support can be found in the disclosure for each amendment. Applicants should point to the page and line numbers of the application corresponding to each amendment, and provide any statements that might help to identify support for the claimed invention (*e.g.*, if the amendment is not supported *in ipsius verbis*, clarification on the record may be helpful). Should Applicants present new claims, Applicants should clearly identify where support can be found in the disclosure.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Jeff Lundgren whose telephone number is 571-272-5541. The Examiner can normally be reached from 7:00 AM to 5:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Christopher Low, can be reached on 571-272-0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffrey S. Lundgren/

Patent Examiner, Art Unit 1639